REMARKS

The Office Action dated April 12, 2007, has been carefully considered. Claims 1-19 are pending. New Claims 16-19 have been added to further define the protection in which Applicant is entitled. Applicant requests that the Examiner consider the following remarks, and then pass the application to allowance.

Double Patenting:

Claims 1-15 were rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over Claims 1-33 of U.S. Patent No. 6,850,965 (inadvertently referred to as U.S. Patent No. 6,850,695).

Applicant attaches with the instant reply a terminal disclaimer, which Applicant respectfully submits obviates the above rejections.

Claim Rejections Under 35 U.S.C. 103(a):

Claims 1-15 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Huang et al. (U.S. Pat. No. 6,052,384) in view of Mitra, et al. (U.S. Pat. No. 6,331,986).

Claim 1 as amended recites A method for optimal multimedia content delivery over networks from a server to one or more clients, comprising: delineating a state variable that represents a data rate for delivery of multimedia content having a fixed duration and wherein an initial data rate is equal to or greater than a minimum flow rate, wherein the minimum flow rate ensures that all required content will be available to each client when needed, and a subsequent data rate, which is equal to or less than a real-time rate of play back of the multimedia content; delineating a set of conditions which represent time-varying constraints on the data rate of said multimedia content said conditions including: (1) the total data rate for all clients does not exceed the maximum throughput of the server or network, whichever is least; (2) the data rate from server to client does not exceed the maximum data rate for the client; (3) the data rate of the client will never overflow a client buffer; (4) the server will never underflow; and (5) the data rate from the server will never be less than the client's minimum data rate, and wherein the minimum data rate is a non-increasing function of time obtained by dividing the content not yet delivered by the remaining play time;

delineating a cost function which represents the value of a proposed solution; performing periodic computations in compliance with conditions (1) - (5) to obtain a state value that maximizes said cost function; and periodically adjusting the data rate to each client to maintain an optimal solution over a given period of time. (Emphasis added).

Initially, as set forth in 35 U.S.C. § 103(a):

> A patent may not be obtained though the invention is not identically disclosed or described … if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. (Emphasis added.)

The Office bears the initial burden of establishing a factual basis to support the legal conclusion of obviousness. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Office must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

For rejections under 35 U.S.C. § 103(a) that are based upon a combination of prior art elements, the Supreme Court stated in *KSR Int'l v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007), that "[a]s is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." Rather, as stated in *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir.), "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *See also In re Fine*, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

Applicants respectfully submit that the applied combination of references does not support a *prima facie* case of obviousness according to these legal standards, since neither Huang nor Mitra teach or suggest delivering multimedia content having a fixed duration and performing periodic computations to obtain a state value that maximizes said cost function, which includes a data rate from the

server, which will never be less than the client's minimum data rate, which is a non-increasing function of time obtained by dividing the content not yet delivered by the remaining play time.

Huang relates to a statistical multiplexer that multiplexes varying bit-rate MPEG-2 bit streams onto a satellite up-link. The multiplexer first allocates each bit stream its minimum bandwidth and then allocates any remaining bandwidth to the bit streams in proportion to the difference between the minimum and maximum output rates for the bit streams, with no bit stream receiving more than its maximum output rate. If there is not enough bandwidth to give every bit stream its minimum rate, bit rates are allocated according to priorities assigned to the bit streams. However, as set forth in the Office Action, Huang does not "specifically disclose performing periodic computations in compliance with claimed conditions to obtain a state value that maximizes a cost function." See page 4 of the Office Action dated April 12, 2007.

Mitra relates to a method for solving the joint problem of optimal routing and optimal bandwidth allocation in a network that supports plural subnetworks and plural communication services. The method involves, for each source-destination pair communicating via a given subnetwork and a given class of service, determining a traffic rate to be offered to each of a set of permissible routes between that source and that destination, in the given subnetwork and service class. The method further involves allocating a respective bandwidth to each link of each subnetwork. The determinations of traffic rate to be offered, and the allocations of bandwidth to respective links of subnetworks, are performed in a mutually responsive manner. However, as set forth in Mitra, et al. and shown in steps 131 and 132 of FIGS. 9 - 11, Mitra, et al. solves the optimum routing problem (box 131) and computes the linearized capacity costs (box 132) for each of the subnetworks Ω, using the current valves of the link capacities. In addition, it should be noted that in this regard that in each iteration of the process represented in box 130, the linearized capacity costs are computed only after the optimum routing solution has converged. Col. 12, lines 27-35.

As set forth above, since neither Huang nor Mitra, et al. teach or suggest a method of delivering multimedia content, which includes a state variable that represents a data rate for delivery of multimedia content having a fixed duration, and performing periodic computations to obtain a state value that maximizes said

cost function, which includes a data rate from the server, which will never be less than the client's minimum data rate, which is a non-increasing function of time obtained by dividing the content not yet delivered by the remaining play time, Claim 1 should be allowable. Claims 2-8 and 15 are dependent from Claim 1 and for the reasons set forth above as to Claim 1, Claims 2-8 and 15 should be allowable.

Claim 9 as amended recites a method for connection acceptance control for delivery of multimedia data from server to one or more clients over a network, comprising the steps of: determining server swing capacity given by the difference between the total server bandwidth and the sum of the minimum flow rates of all currently-connected clients receiving multimedia data having a fixed duration, wherein the minimum flow rate for each client is expressed as a non-increasing function of time obtained by dividing content not yet delivered by remaining play time, and wherein the minimum flow rate ensures that all required content will be available to each client when needed; and allocating server bandwidth for each prospective client which will fit without server bandwidth saturation, as determined by comparing an average data play rate of each prospective client with the remaining bandwidth, represented by said server swing capacity, available to the server. (Emphasis added)

As set forth above, since neither Huang nor Mitra et al. teach or suggest a method for connection acceptance control for delivering of multimedia data, which includes receiving multimedia data having a fixed duration, wherein the minimum flow rate for each client is expressed as a non-increasing function of time obtained by dividing data not yet delivered by remaining play time, and wherein the minimum flow rate ensures that all required data will be available to each client when needed, Claim 9 should be allowable. Claims 10-13 are dependent from Claim 9, and for the reasons set forth above as to Claim 9, Claims 10-13 should be allowable.

Claim 14 as amended recites a method for bandwidth allocation for delivery of multimedia data from a server to one or more clients over a network, the method comprising: storing multimedia data on at least one server, the multimedia data having a fixed duration; delivering the multimedia data from the

at least one server to at least one client device upon demand of the at least one client by way of a network having a defined bandwidth, and wherein the multimedia data is available for playback upon client request; storing a sequence of data representing scheduled bandwidth changes for the at least one server; determining a maximum flow rate and a minimum flow rate for each of the one or more clients at the present time, the determination of the minimum flow rate being based on a non-increasing function of time obtained by dividing multimedia data not yet delivered by remaining play time, and wherein the minimum allowed flow rate ensures that all required multimedia data will be available to each client when needed; determining the flow rate range for each client as given by the difference between said maximum flow rate and said minimum flow rate; sorting the list of clients according to said flow rate range; initializing current flow rate for each client as said minimum flow rate and summing said flow rate into total server flow rate; and allocating remaining server bandwidth to remaining clients. (Emphasis added).

As set forth above, since neither Huang nor Mitra et al. teach or suggest storing multimedia data on at least one server, the multimedia data having a fixed duration and determining a maximum flow rate and a minimum flow rate for each of the one or more clients at the present time, wherein the determination of the minimum flow rate being based on a non-increasing function of time obtained by dividing multimedia data not yet delivered by remaining play time, and wherein the minimum allowed flow rate ensures that all required multimedia data will be available to each client when needed, Claim 14 should be allowable.

New Claims 16-19:

Claims 16 and 17 recite the method of Claim 1, further comprising ceasing delivery of the multimedia content to the at least one client when the content not yet delivered is equal to zero; and further comprising accepting a new client by: determining an admission capacity of the bandwidth; admitting a prospective client if the clients minimum allowed value of the state variable is less than the admission capacity; and wherein a client admitted for service is guaranteed to have sufficient content flow over the entire session, respectively. For the reasons set forth above as to Claims 1, Claim 16 and 17 should be allowable.

Claims 18 and 19 recite the method of Claim 14, further comprising ceasing delivery of the multimedia data to the at least one client when the data not yet delivered is equal to zero; and further comprising accepting a new client by: determining an admission capacity of the bandwidth; admitting a prospective client if the remaining clients minimum allowed value of the state variable is less than the admission capacity; and wherein a new client admitted for service is guaranteed to have sufficient data flow over the entire session, respectively. For the reasons set forth above as to Claim 14, Claims 18 and 19 should be allowable.

Conclusion:

In view of the preceding discussion, Applicant respectfully urges that the claims of the present application define patentable subject matter and should be passed to allowance. Such allowance is respectfully solicited.

If the Examiner believes that a telephone call would help advance prosecution of the present invention, the Examiner is kindly invited to call the undersigned attorney.

Respectfully submitted,

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